UK Health Security Agency

Independent review of daily contact testing pilots

Contents

Background

Daily contact testing (DCT)[1] was introduced as a policy in December 2020 following modelling studies[2] submitted to the Scientific Advisory Group for Emergencies (SAGE) that proposed that DCT was at least as effective as self-isolation in limiting onwards transmission of SARS-CoV-2. The DCT policy was implemented initially through 3 pilots. The primary evaluation objective of the 3 pilots was to assess the operational feasibility of DCT, including its acceptability to those involved, to inform potential wider roll out. Additionally, the evaluations sought to test the assumptions behind the modelling underpinning DCT to ensure appropriate implementation. None of the DCT pilots explicitly set out to provide substantive evidence of its effectiveness in limiting onwards transmission.

A review of the pilots by 3 independent academics was commissioned by NHS Test and Trace with the primary objective of ensuring that the data collected had not been interpreted with an optimism bias.

DCT pilots

Table 1. The 3 DCT pilots

Pilot A (Workplaces)	An evaluation of daily contact testing of workers in private industries between 14 December 2020 and 15 March 2021
Pilot B (NHS)	An evaluation of the pilot of daily contact testing of healthcare workers in NHS acute hospital and ambulance trusts between 9 January 2021 and 28 February 2021
Pilot C (home-based citizens, also known as Agile Lighthouse)	An evaluation of the acceptability of daily testing contacts of confirmed coronavirus (COVID-19) cases using serial, self-administered lateral flow devices between 11 December 2020 and 12 January 2021

Reviewers

Members of the NHS Test and Trace's Testing Initiatives Evaluation Board (TIEB) were invited to undertake this review and 3 recognised experts within relevant fields of academic research accepted the invitation. The reviewers provided their views independently of each other – a consensus view was not requested. None of the reviewers had been involved in evaluation of

[1] DCT involves limited release from self-isolation following a negative test using a lateral flow device (LFD) and repeating this each day for 7 consecutive days after being identified as a close contact of someone who has tested positive for SARS-CoV-2. This DCT principle has been considered as an alternative to self-isolation.
[2] Quilty BJ, Clifford S, Hellewell J, Russell TW, Kucharski AJ, Flasche S and others. 'Quarantine and testing strategies in contact tracing for SARS-CoV-2: a modelling study' The Lancet Public Health 2021: volume 6, issue 3, pages e175-e83.

the pilots, though as members of TIEB, they had previously been party to Board discussions of pilot design and reported outcomes.

Table 2. Three expert reviewers

Professor Sheila Bird	Professor John Edmunds	Professor Timothy Peto
Biostatistician Formerly Programme Leader, MRC Biostatistics Unit, Cambridge and Honorary Professor, College of Medicine and veterinary Medicine, Edinburgh University	Epidemiologist London School of Hygiene and Tropical Medicine	Professor of Medicine and Consultant in Infectious Disease University of Oxford and Oxford University Hospitals NHS Foundation Trust

Review methodology

The reviewers were provided with the complete long form report from each pilot. Full data sets were not provided but could and would have been made available if requested. Each reviewer was asked to comment on 3 aspects of each of the pilots:

1. Study design
2. Data analysis
3. Outcomes

Using a framework of questions to focus their responses (Annex A). This document presents the findings and recommendations of the independent reviewers.

Summary of findings

None of the reviewers stated that data had been over-interpreted. However, all 3 were clear that further clinical trials, which were under development at the time and were carried out between April and July 2021[3,4], were required to determine the associated epidemiological risk, and that these should be conducted within a formal research governance environment. This recommendation was implemented in the clinical trials mentioned above.

It was noted that the evidence gathered from the pilots on the operational feasibility of DCT in workplaces and the acceptability to participants was encouraging but these findings could have been affected by the selection bias of the study designs.

[3] Peto T and others. (2021) 'A cluster randomised trial of the impact of a policy of daily testing for contacts of COVID-19 cases on attendance and COVID-19 transmission in English secondary schools and colleges'
[4] Isabel Oliver and others (2021) 'A non-inferiority randomised controlled trial to assess the risk of onward infection transmission from contacts of confirmed COVID-19 cases who use daily lateral flow tests to enable exemption from isolation 3 compared to standard self-isolation'

Detailed findings and recommendations

1. Study design

The reviewers observed that all 3 pilots lacked suitable control groups and were non-randomised. Challenges to data capture in Pilot A resulted in uncertainty in the quality of the data and severely limited the extent to which useful analysis could be undertaken to inform our understanding of the safety of DCT in this setting. The variation in the protocols implemented during Pilot B were not fully investigated in terms of the impact they had on outcomes. All pilots sought individual consent of people to participate in DCT, but Pilots A and B were not conducted under formal research governance. Two of the reviewers believed that this should have been sought.

The following features of Pilot C were picked out as commendable for being included:

- cycle threshold values (Ct) of polymerase chain reaction (PCR) positives
- laboratory linkage check to identify if participants had accessed PCR-testing outside of the study
- the direct comparison of lateral flow device (LFD) and PCR for all participants and the checking of the LFD results by 2 independent reviewers
- bespoke design of data capture
- informed consent of participants within a research ethics governance structure and research ethics approval for the study

Reviewers recommendations which were considered in the development of DCT clinical trials study designs

To:

a. aim for randomised control trials that are powered to deliver firm epidemiological conclusions
b. use formal research ethics governance and continue to gain informed consent of participants
c. encourage higher participation in surveys for example, through good survey design
d. consider ways to limit the effects on behaviour being observed during a study – through surveys and interviews in a scientifically considered approach
e. future studies should include at least one routine PCR test in addition to daily LFDs
f. outcome measures should include:
    a. compliance with the DCT principle of continuous and repeat testing
    b. barriers and facilitators to compliance
    c. acceptability of the DCT regime
    d. uptake
    e. cost and cost-effectiveness

f. practical challenges
g. monitor onward transmission

2. Data analysis: completeness and interpretation

All 3 reviewers commented that greater data completeness could have been achieved by:

- increased clarification of the denominator used to express key metrics, such as positivity rates in Pilot B
- plotting the distribution of Ct values for positive tests
- qualification of means by increased statistical analysis, for example standard deviations or standard errors in Pilot C
- redefining the criteria for an ‘outbreak’ in Pilot A

It was noted that due to the study design limitations outlined above the inference of the findings needed to be treated cautiously so as not to over-interpret the data. As such the reviewers concurred with the pilot reports that epidemiological risk could not be determined with sufficient robustness from the data in any of the 3 pilots. The reviewers all stated that there was insufficient data to make robust conclusions on the analysis of secondary attack rates. It was noted for Pilot B that, without taking into account the incidental PCR results, the pilot might have been interpreted as delivering an unduly optimistic outcome.

Recommendations for further data analysis of pilot data to enhance the study reports

To:

- analyse the degree of variance in key metrics such as positivity rates between DCT sites and non-DCT sites in Pilot A
- conduct cost analysis for PCR and genomic sequencing
- analyse the value for testing on days 6 and 7 in Pilot C

3. Outcomes: consequences for wider roll-out of DCT in the workplace

All 3 reviewers concluded that due to the limitations in these initial pilots study designs outlined above there was not yet sufficient evidence from the presented evaluations to fully understand the risk of onwards transmission.

The benefits of DCT to employers may be context-specific and could not be properly assessed by the evidence presented in these 3 initial pilots. The acceptability of DCT to both employers and employees was favourable but interpretation of results was limited by the response rates to surveys and interviews and therefore could be subject to bias. As well as improved study

design to better answer the epidemiological questions around DCT, the reviewers also noted that improved data collection systems would be beneficial in future rollouts.

Recommendations for a potential wider rollout of DCT

To:

- develop bespoke data collection for DCT – keep routine testing results separate from the central data system
- provide tailored training to both employees and employers prior to workplace participation in DCT

Annex A. Questions for review to consider

Based on the available reports and analyses on the DCT pilots, the following questions were posed to the reviewers as a guiding framework.

1. How can the data and analyses collected so far be used to best inform the decision on next steps for DCT in the workplace?
a. Are there any improvements in the analyses you would recommend, given the data available?
b. Considering the data limitations, are there any other analyses that you would recommend with the available data set?
c. To what extent do you agree with the interpretation of the data presented?
d. How does this analysis link back to the original assumptions in the modelling?
2. Guidance on improvement in the design of DCT as an intervention
a. For ongoing monitoring and continuous improvement, what would be the most valuable behavioural measurement tools?
b. Are there lessons to be learned from other DCT pilots and services, or non-DCT research in comparable situations, which you would recommend introducing to improve the service design?
3. Guidance and recommendations for a wider roll out of DCT in the workplace
a. Overall, what key risks and benefits does the evidence suggest for scaling DCT?
b. Are there any changes to the programme that you would recommend if a scale up were to take place?

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UKHSA is an executive agency, sponsored by the Department of Health and Social Care.

Published: March 2022
Publishing reference: GOV-11626

UKHSA supports the Sustainable Development Goals